Space Weather Forecast

Issued on Thursday, 31 August 2023 at 13:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of G1/Minor Storm intervals day 2 (01 Sep) from arrival of fast winds, and later day 3 or early day 4 (02-03 Sep due to CME arrival). Chance of Isolated M-flares (R1 Blackout)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only low common class flares observed. There are currently five sunspot regions on the visible disc. The largest region is in the northwest disc, and this is the most likely source of flare activity with ongoing development of peripheral spots, and a moderate complexity. The next likely region is in the southeast, as while smaller it does have a slightly more unusual structure with two main negative leaders and only small trailer spots. In the southwest, a further spot persists as a simple and slowly weakening bipolar spot. The other two regions are simple mature unipolar spots.

A filament (ribbon of material held together by the Suns magnetic field) was observed lifting off the northwest of centre-disc at around 30/2100 UTC. This was a slightly unusual event as despite being located in the northwest, the subsequent coronal mass ejection (CME) was to the south and slightly to the east, perhaps due to the proximity of a coronal hole to the northwest of the eruption. While analysis is ongoing this preliminarily been assessed as Earth-directed, likely arriving late day 3 or early day 4 (02-03 Sep).

Solar Wind / Geomagnetic Activity: Background solar winds were observed, with speeds around 300-350 km/s. The interplanetary magnetic field was weak, while its north-south component remained weakly variable. Geomagnetic activity was Quiet (Kp 0-2) .

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: : Activity is expected to be Low with a chance of rising to Moderate due to any M-flares, most likely from the larger sunspot region in the northwest.

Solar Wind / Geomagnetic Activity: CME from the eruption 30/2100 UTC, is currently anticipated to arrive late day 3 or early day 4 (02-03 Sep), however analysis is ongoing. Current background winds are also expected to become enhanced day 2 (01 Sep) due to the onset of the fast winds from a coronal hole in the north disk, although confidence is low due to the northern location of the feature, and it being largely obscured from view. These fast winds are then likely to ease for a time, before the CME arrival. Quiet geomagnetic activity at first is forecast to become Unsettled to Active with a chance of G1/Minor Storms with fast winds later day 2 (01 Sep). Any CME arrival later day 3 or early day 4 (02-03 Sep) will then bring a chance of G1 Minor Storms, with a slight chance G2 Moderate Storms, before easing later day 4.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background levels with no solar radiation storms expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	30	30	30
Strong	G3	No	1	1	5	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.